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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SAMUEL FINEBERG, PANKAJ MEHRA,
and ROGER HANSEN

Appeal 2009-005641
Application 10/808,138
Technology Center 2100

Before JAMES D. THOMAS, ST. JOHN COURTENAY III, and
JAMES R. HUGHES, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL¹

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

Appellants seek our review under 35 U.S.C. § 134 of the Examiner's final decision rejecting claims 1-11. Claims 12-46 have been cancelled. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We Affirm.

BACKGROUND

Appellants' invention is directed to:

A system and method is described that accesses a network persistent memory unit (nPMU). One embodiment comprises a primary region corresponding to a predefined portion of a primary network persistent memory unit (nPMU) communicatively coupled to at least one client processor node via a communication system, wherein the primary region is assigned to a client process running on the client node and is configured to store information received from the client process; and a mirror region corresponding to a predefined portion of a mirror nPMU communicatively coupled to the client processor node via the communication system, wherein the mirror region is assigned to the client process and is configured to store the information received from the client process.

(Spec. 2-3, para. [0007]).

Claim 1 is illustrative:

1. A persistent memory access system, comprising a primary network persistent memory unit (nPMU) comprising:

a network interface communicatively coupled to at least one client processor node over a remote direct

memory access (RDMA) enabled communication system; and

a primary region coupled to the network interface and configured to store information, the primary region is assigned to a client process running on the client processor node and stores information received from the client process;

said primary nPMU executes single byte RDMA requests directed to the primary region, the single byte RDMA requests received through the network interface;

a mirror nPMU comprising:

a network interface communicatively coupled to at least one client processor node and the primary nPMU over the remote direct memory access (RDMA) enabled communication system; and

a mirror region coupled to the network interface of the mirror nPUM [*sic.*] and configured to store information, the mirror region is assigned to the client process and stores the information received from the client process.

The Examiner relies on the following prior art references as evidence of unpatentability:

Zhang	US 7,251,713 B1	Jul. 31, 2007
Golding	US 6,477,617 B1	Nov. 5, 2002
Olson	US 5,479,628	Dec. 26, 1995
Garg	US 7,266,645 B2	Sep. 4, 2007

Romanow, A., and Bailey, S. "An Overview of RDMA Over IP," The Internet Society, 2002. Retrieved from the Internet, <http://datatag.web.cern.ch/datatag/pfldnet2003/papers/romanow.pdf>.

(hereinafter “RDMA”).

"The Authoritative Dictionary of IEEE Standards Terms" 2000, IEEE, 7th Edition, Page 46. (hereinafter “IEEE”).

Appellants appeal the following rejections:

1. Claims 1, 2, 8, 10, and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang and RDMA.²
2. Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, and Golding.
3. Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, Golding and Olson.
4. Claims 6 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, and Garg.
5. Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, and IEEE.

GROUPING OF CLAIMS

Based on Appellants’ arguments in the Brief, we decide the appeal on the basis of representative claims 1 and 10. *See* 37 C.F.R.

§ 41.37(c)(1)(vii).

² We note that Appellants incorrectly refer to claims 1, 2, and 8 as standing rejected as being “allegedly anticipated by Frank.” (App. Br. 10). We consider this oversight as a typographical error, as no anticipation rejection is before us on appeal. Nor is there a “Frank” reference of record. This error is repeated on page 13 of the principal Brief.

ISSUES

Based upon our review of the administrative record, we have determined that the following issues are dispositive in this appeal:

1. Under § 103, did the Examiner err by improperly combining the Zhang and RDMA references?
2. Under § 103, did the Examiner err in finding that the combination of Zhang and RDMA would have taught or suggested the claimed network interfaces, within the meaning of representative claim 1?
3. Under § 103, did the Examiner err in finding that the combination of Zhang and RDMA would have taught or suggested a Persistent Memory Manager (PMM) that “causes the primary nPMU to create the primary region and causes the mirror nPMU to create the mirror region,” within the meaning of representative claim 10?

FINDINGS OF FACT

We adopt the Examiner’s findings in the Answer and Final Office Action as our own, except as to those findings that we expressly overturn or set aside in the Analysis that follows. We add the following factual findings:

1. Zhang teaches “an exemplary network system . . . [that] includes a number of computer systems 102-105, primary controllers 108-109, and secondary controllers 112-115.” (Col. 3, ll. 18-22; *see also* Fig. 1).

ANALYSIS

Combinability of the references under § 103

We begin our analysis by deciding the threshold issue of whether the Examiner erred by improperly combining the Zhang and RDMA references under §103.

Appellants note that Zhang is concerned with large block-level storage devices (i.e., multiple bytes in every read/write operation). (App. Br. 12). Because Zhang is silent regarding direct memory access (DMA) or remote direct memory access (RDMA), Appellants contend that “such byte-level granularity runs contrary to Zhang’s intended purpose of large file-level mirroring and subsequent back-up.” (*Id.*). In particular, Appellants argue:

If Zhang's file-level mirroring is modified to operate at byte-level granularity, the ability of Zhang's computer or servers to mirror, transfer the mirror copy and backup the mirror copy without adverse effect is severely diminished if not totally destroyed by the additional overhead of transferring file-level data across a communication path geared for byte-level granularity.

(App. Br. 13).

However, we find the Appellants’ argument is met by a stronger argument from the Examiner. The Examiner responds:

Zhang teaches, generally, a system with primary and secondary storages connected over a network and mirroring across the network between the two storages. The use of large block-level data storage devices and file-level mirroring with snapshots is merely one embodiment

of the Zhang system and not necessarily essential to fulfill the intended purpose of mirroring data to a remote location. Zhang is relied upon to teach the configuration and arrangement of the processors, storages, and network connections. However, as detailed in the rejections, it would have been obvious to replace the file-level mirroring and storages with storages that facilitate byte-level RDMA access that were known at the time the invention was made since doing so would have been a simple substitution with a predictable result. Although such a change would require modifications to the specific details of operation within the Zhang system, such a change would not affect the intended purpose taught by Zhang, i.e. mirroring to a remote backup site, or the principle of operation, i.e. copying data from a primary storage to a secondary storage. Such a modification would have enabled the additional benefits of byte-level RDMA such as enabling copying without direct control of the processor.

(Ans. 7-8).

Based upon our review of the record, we are in accord with the Examiner's factual findings and ultimate legal conclusion that "it would have been obvious to replace the file-level mirroring and storages with storages that facilitate byte-level RDMA access that were known at the time the invention was made *since doing so would have been a simple substitution with a predictable result.*" (*Id.*) (emphasis added).

On this record, we agree with the Examiner's finding that Appellants' purported improvement over the prior art represents no more than the predictable use of prior art elements according to their established functions, and thus would have been obvious to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex Inc.* 550 U.S. 398, 417 (2007) ("when a patent

‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious.”) (citing *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282 (1976)).

We further observe that Appellants have not responded in the Reply Brief to the Examiner’s additional remarks addressing the combinability of the references. (Ans. 8). *Cf. Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 572 (1985) (“Silence implies assent.”).

Moreover, Appellants have not rebutted the Examiner’s legal conclusion of obviousness by showing that the claimed combination of familiar elements produces any new function. Appellants have not provided any factual evidence of secondary considerations, such as unexpected or unpredictable results, commercial success, or long felt but unmet need.

Thus, when we take account of the inferences and creative steps that a person of ordinary skill in the art would have employed, we find the Examiner has articulated a reasoning with a rational underpinning that reasonably supports the legal conclusion of obviousness.

Therefore, we find Appellants’ arguments unavailing regarding the combinability of the cited references for essentially the same reasons articulated by the Examiner in the Answer, and for the reasons discussed above. Accordingly, we find the Examiner did not err by improperly combining the Zhang and RDMA references under § 103.

Representative Claim 1 - *limitations*

We decide the question of whether the Examiner erred in finding that the combination of Zhang and RDMA would have taught or suggested the claimed network interfaces, within the meaning of representative claim 1.

Appellants contend that the “[o]ffice action fails to cite to any portion [of] Zhang or RDMA for the claimed network interfaces.” (App. Br. 10).

Contrary to Appellants’ contention, the Examiner expressly states in the rejection of claim 1 that “storage controllers 108 provide *network interface connections* with clients and other controllers, *see figure 1 and column 3, lines 42-45.*” (Ans. 3) (emphasis added).

Thus, Appellants have failed to present substantive arguments traversing the Examiner’s findings.³ Moreover, we observe that Zhang describes Figure 1 as “an exemplary network system . . . [that] includes a number of computer systems 102-105, primary controllers 108-109, and secondary controllers 112-115.” (FF 1). Because we find the network system shown in Zhang’s Figure 1 necessarily requires network interfaces to implement communications between and among the respective network elements, we are in accord with the Examiner’s findings.

³ Mere attorney arguments and conclusory statements that are unsupported by factual evidence are entitled to little probative value. *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997); *see also In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984); and *Ex parte Belinne*, No. 2009-004693, slip op. at 7-8 (BPAI Aug. 10, 2009) (informative), *available at* <http://www.uspto.gov/web/offices/dcom/bpai/its/fd09004693.pdf> .

On this record, we find no reversible error in the Examiner's § 103 rejection of representative claim 1. Therefore, we sustain the Examiner's rejection of representative claim 1, as well as dependent claims 2 and 8 (not argued separately) which fall therewith. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Representative Claim 10 - *limitations*

We decide the question of whether the Examiner erred in finding that the combination of Zhang and RDMA would have taught or suggested a Persistent Memory Manager (PMM) that “causes the primary nPMU to create the primary region and causes the mirror nPMU to create the mirror region,” within the meaning of representative claim 10.

At the outset, Appellants restate their previous argument that the “[o]ffice action fails to cite to any portion [of] Zhang or RDMA for the claimed network interfaces.” (App. Br. 14). We find this argument unavailing for the same reasons discussed *supra* regarding claim 1.

Regarding the claimed Persistent Memory Manager (PMM), the Appellants contend:

Any inherent teaching of Zhang with regards to allocations could only be that each storage controller allocates space only on its directly attached storage devices. Thus, even if hypothetically proper to rely on one of Zhang's storage controller 108 or 112 for the claimed persistent memory manager (which Applicant's do not admit), Zhang and RDMA still fail to teach a persistent memory manager that ‘causes the primary

nPMU to create the primary region and causes the mirror nPMU to create the mirror region' as neither controller would have the ability to allocate on non-locally coupled storage devices.

(App. Br. 15-16).

However, the Examiner disagrees:

In response, [the] Examiner points out that Appellant has misconstrued the rejection from the Office action. Examiner has clarified the rejection to show that the primary storage 116 and secondary storage 118 are what is relied to teach the memory units. Storage controllers 108 and 112 are relied upon to provide the teaching for the network interface and the persistent memory manager. This meets the limitations of the claims since the persistent memory manager is claimed to be coupled with the client processor.

Appellant also argues that Zhang and RDMA do not teach the persistent memory manager capable of allocating space on a non-locally coupled storage device. In response, Examiner points out that this limitation is not required in the claim since the broadest reasonable interpretation of the language could include multiple persistent memory managers coupled to local client processors so long as the primary nPMU creates a primary region and a mirror nPMU creates a mirror region. The claim does not require that one persistent memory manager perform both allocations or that both allocations be performed together with some special relationship, only that both allocations be capable of being performed. Thus Zhang teaches the limitations of the claim since it teaches a PMM capable of causing a primary nPMU to create a primary region a PMM capable of caus[ing] the mirror nPMU to create a mirror region.

(Ans. 8-9).

In the Reply Brief, Appellants further contend that “[t]here is only one PMM claimed, and the claimed PMM causes the creation of both the primary and mirror nPMU regions, so Appellants fail to see how ‘the claim does not require that one persistent memory unit’ perform the claimed functions.” (Reply Br. 1).

We begin our analysis by observing that claim 10 expressly recites “further comprising a persistent memory manager (PMM)” Given this claim language, we are in accord with the Examiner’s broader interpretation because our reviewing court has repeatedly emphasized “that an indefinite article ‘a’ or ‘an’ in patent parlance carries the meaning of ‘one or more’ in open-ended claims containing the transitional phrase ‘comprising.’” *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000) (citing *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999); *Abtox, Inc. v. Exitron Corp.*, 122 F.3d 1019, 1023 (Fed. Cir. 1997); *North Am. Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 1575-76, (Fed. Cir. 1993)).

Moreover, we find Zhang’s use of an allocation map (col. 5, l. 11) evidences that the general concept of allocation (i.e., creation) of memory regions in a mirrored storage system (col. 5, l. 8) was well known in the art. We note that the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *See In re Kahn*, 441 F.3d 977, 987-88 (Fed. Cir. 2006)(underline added). This reasoning is applicable here.

On this record, we find no reversible error in the Examiner's § 103 rejection of representative claim 10. Therefore, we sustain the Examiner's rejection of representative claim 10, as well as associated claim 11 (not argued separately) which falls therewith. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Claims 3 and 4 (second stated rejection)

Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, and Golding. Appellants state that “[c]laims 3 and 4 are allowable for the same reasons as discussed in Section VII(A)(1)” of the Brief. (App. Br. 16). We note that Section VII(A)(1) of the principal Brief (pp. 10-13) presents arguments regarding claim 1 that we have addressed above. Because we did not find Appellants' arguments persuasive regarding claim 1, we sustain the Examiner's rejection of claims 3 and 4 for the same reasons discussed above regarding independent claim 1.

Claim 5 (third stated rejection)

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, Golding and Olson. Appellants state that “[c]laim 5 is allowable for the same reasons as discussed in Section VII(A)(1)” of the Brief. (App. Br. 16). We note that Section VII(A)(1) of the principal Brief (pp. 10-13) presents arguments regarding claim 1 that we have addressed above. Because we did not find Appellants' arguments persuasive regarding claim 1, we sustain the Examiner's rejection of claim 5 for the same reasons discussed above regarding independent claim 1.

Claims 6 and 7 (fourth stated rejection)

Claims 6 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, and Garg. Appellants state that “[c]laims 6 and 7 are allowable for the same reasons as discussed in Section VII(A)(1)” of the Brief. (App. Br. 16). We note that Section VII(A)(1) of the principal Brief (pp. 10-13) presents arguments regarding claim 1 that we have addressed above. Because we did not find Appellants’ arguments persuasive regarding claim 1, we sustain the Examiner’s rejection of claims 6 and 7 for the same reasons discussed above regarding independent claim 1.

Claim 9 (fifth stated rejection)

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Zhang, RDMA, and IEEE. Appellants state that “[c]laim 9 is allowable for the same reasons as discussed in Section VII(A)(1)” of the Brief. (App. Br. 16). We note that Section VII(A)(1) of the principal Brief (pp. 10-13) presents arguments regarding claim 1 that we have addressed above. Because we did not find Appellants’ arguments persuasive regarding claim 1, we sustain the Examiner’s rejection of claim 9 for the same reasons discussed above regarding independent claim 1.

CONCLUSION

On this record, we find Appellants’ arguments unpersuasive of reversible error regarding the Examiner’s factual findings and ultimate legal conclusion of obviousness.

DECISION

We affirm the Examiner's § 103 rejections for claims 1-11.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1) (2009).

ORDER

AFFIRMED

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